

FORAGE SUITABILITY GROUP

Loam

FSG No.: G102BY100SD**Major Land Resource Area:** 102B - Till Plains

Physiographic Features

Soils in this group typically occur on upland positions such as backslopes, footslopes, toe slopes, and glaciated plains. They may also occur on stream terraces and non-flooded alluvial plains.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	980	1640
Slope (percent):	0	15
Flooding:		
Frequency:	None	Rare
Duration:	None	Very Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	High

Climatic Features

Annual precipitation varies widely from year to year in MLRA 102B. Average annual precipitation for all climate stations listed below is about 24 inches. Over 75 percent of that occurs during the months of April through September. On average, there are about 30 days with greater than .1 inches of precipitation during the same timeframe. Precipitation is less than needed for optimum forage production and is the single largest factor limiting production from this group on non-irrigated lands.

Average annual snowfall ranges from 25 to 39 inches across the MLRA. Snow cover at depths greater than 1 inch range from 15 days at Bridgewater to 79 days at Madison.

Average July temperatures are about 75°F and average January temperatures are about 15°F. Recorded temperature extremes in the MLRA are a low of -36 degrees and a high of 110 degrees both recorded at Sioux Falls.

Average annual wind speeds at Sioux Falls are 11 mph with the highest wind speeds occurring during March and April. It is cloudy an average of 157 days a year at Sioux Falls, with the greatest incidence of cloudy weather occurring in November and December. Average morning relative humidity in June is 82 percent and average afternoon humidity is 59 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at <http://www.wcc.nrcs.usda.gov>.

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	139	154
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	May 13	May 03
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 24	May 17
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 10	Sep 19

	From Sep 19	To Sep 30
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)		
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	117	133
Growing Degree Days (40 deg):	4565	5314
Growing Degree Days (50 deg):	2600	3179
Annual Minimum Temperature:	-25	-20
Mean annual precipitation (inches):	23	25

Monthly precipitation (inches) and temperature (F):

2 years in 10:	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Precip. Less Than	0.13	0.19	0.63	1.12	1.56	1.86	1.71	1.47	1.33	0.71	0.20	0.26
Precip. More Than	0.73	1.35	2.33	3.33	4.79	5.83	4.96	4.17	3.71	2.66	1.63	1.04
Monthly Average:	0.47	0.62	1.64	2.36	3.26	3.70	3.17	2.80	2.62	1.66	1.04	0.67
Temp. Min.	2.1	8.2	20.8	34.5	45.9	55.5	60.8	57.9	48.3	36.5	22.5	8.0
Temp. Max.	29.9	35.8	48.2	64.6	75.4	84.7	89.3	86.3	78.1	66.3	48.0	32.9
Temp. Avg.	15.1	21.3	33.5	48.1	59.9	69.4	74.7	71.9	62.2	50.2	34.2	19.7

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD1579	Centerville, SD	1961	1990
SD8622	Vermillion, SD	1961	1990
SD5481	Menno, SD	1961	1990
SD5228	Marion, SD	1961	1990
SD1032	Bridgewater, SD	1961	1990
SD9502	Yankton, SD	1961	1990
SD8472	Tyndall, SD	1961	1990
SD5090	Madison Research Farm, SD	1962	1990
SD7667	Sioux Falls, SD	1961	1990
SD1392	Canton, SD	1961	1990

Soil Interpretations

This group consists mostly of well drained, medium to moderately fine textured soils formed predominately from alluvium, colluvium, glacial till, and loess. They are very deep soils with high available water capacity and moderately slow to moderate permeability.

Drainage Class:	Moderately well drained	To	Well drained
Permeability Class: (0 - 40 inches)	Moderately slow	To	Moderate
Frost Action Class:	Moderate	To	High

	<u>Minimum</u>	<u>Maximum</u>
Depth:	72	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent): (surface layer)	1.0	8.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	4
Sodium Absorption Ratio: (0 - 12 inches)	0	2
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	5.6	8.4

	<u>Minimum</u>	<u>Maximum</u>
Available Water Capacity (inches): (0 - 60 inches)	9	13
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	15

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed at <http://plants.usda.gov/>.

<u>Cool Season Grasses</u>	<u>Dryland</u>	<u>Irrigated</u>
Canada wildrye	F	NS
Green needlegrass	G	NS
Intermediate wheatgrass	G	G
Meadow brome	G	G
Orchardgrass	G	G
Pubescent wheatgrass	G	G
Smooth brome	G	G
Tall fescue	F	F
Tall wheatgrass	G	NS
Timothy	F	F
Virginia wildrye	F	NS
Western wheatgrass	F	NS

<u>Warm Season Grasses</u>	<u>Dryland</u>	<u>Irrigated</u>
Big bluestem	G	G
Indiangrass	G	G
Little bluestem	F	NS
Prairie sandreed	F	NS
Sand bluestem	F	NS
Sideoats grama	F	NS
Switchgrass	G	G

<u>Legumes</u>	<u>Dryland</u>	<u>Irrigated</u>
Alfalfa	G	G
Birdsfoot trefoil	G	G
Canada milkvetch	F	NS
Cicer milkvetch	G	F
Illinois bundleflower	F	NS
Purple prairieclover	F	NS
Red clover	F	G
White prairieclover	F	NS

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

NS - Not suited

Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields, and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture

harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop	Dryland		Irrigated	
	Management Intensity		Management Intensity	
	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	11400	4300		
Alfalfa/Intermediate wheatgrass	10800	4300	17100	10300
Alfalfa/Smooth brome grass	10800	4300	17100	10300
Big bluestem	8600	4300		
Intermediate wheatgrass	7100	3700	14300	8600
Smooth brome grass	6600	3700	14300	8600
Switchgrass	8600	4000		

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: SD0001
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa, MLRAs 107, 102B, 63B, 66, 65

Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	30	25	20	15	5	0	0	0

Growth Curve Number: SD0004
Growth Curve Name: Cool season grass
Growth Curve Description: Cool season grass, statewide

Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	10	40	30	10	5	5	0	0	0

Growth Curve Number: SD0005
Growth Curve Name: Warm season grass
Growth Curve Description: Warm season grass, statewide

Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	0	10	40	35	15	0	0	0	0

Growth Curve Number: SD0003
Growth Curve Name: Irrigated Alfalfa
Growth Curve Description: Irrigated Alfalfa, statewide

Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	25	25	20	15	10	0	0	0

Soil Limitations

These soils have few limitations to the production of climatically adapted forage crops. On steeper slopes, water erosion is a potential problem during establishment, when renovating stands, and in thin established stands. Livestock trail erosion is a potential problem in established stands.

Management Interpretations

Including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate erosion control practices during the establishment period. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

FSG Documentation

Similar FSGs:

<u>FSG ID</u>	<u>FSG Narrative</u>
G102BY109S	Steep Loam soils are more steeply sloping with greater runoff potential.
G102BY120S	Droughty Loam soils are shallower or coarser textured resulting in lower available water capacity and lower production potential.
G102BY500S	Overflow soils receive additional moisture due to a favorable landscape position resulting in a higher production potential.

Inventory Data References

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone Maps
National Soil Survey Information System (NASIS) for soil surveys in South Dakota counties in MLRA 102B
South Dakota NRCS South Dakota Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation

This site has been correlated with the following states: South Dakota

Forage Suitability Group Approval

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